method for fat suppression. Three studies investigated the role of gadolinium in the SIJs, and overall found minimal added value. Bone marrow oedema of the sacroiliac joint (SIJ) was found to be the most sensitive and specific lesion in the diagnosis of axSpA in seven studies. Sensitivity and specificity were increased by including other structural lesions, particularly bone marrow fat or erosions. Four studies addressed the utility of SIJ fat infiltration, demonstrating good sensitivity but relatively poor specificity. A number of studies addressing erosions, high T1 signal in the SIJ, fluid signal in the SIJ, ankylosis, sclerosis, capsulitis, backfill and vacuum phenomenon reported low to moderate diagnostic performance for these features. In the spine, four studies reported moderate sensitivity and specificity for corner inflammatory lesions, and four reported poor sensitivity and specificity for spinal fatty lesions. Three studies evaluated agreement between observers for inflammatory and structural features. Agreement was best for the presence of oedema in the SIJs, but was poor for structural features. Agreement was weak to moderate for global diagnosis.

Conclusions: These results have informed the recommendations of a consensus group aiming to standardise practice around the use of MRI scans in the UK.

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SAT0674 THE USE OF QUANTITATIVE MUSCLE ULTRASOUND AS A FOLLOW-UP TOOL IN INFLAMMATORY MYOSITIS AND DUCHENNE MUSCULAR DYSTROPHY IN CHILDREN

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Background: Ultrasound (US) can provide a painless and noninvasive tool for evaluation and follow up of muscle diseases especially in young children who may have restrictions in execution of muscle strength tests and functional scales.

Objectives: This study aimed to assess skeletal muscle structural status in children with Juvenile dermatomyositis (JDM) and Duchenne muscular dystrophy (DMD) using quantitative muscle US and to perform a longitudinal follow up of these changes over time and correlate these findings with clinical parameters, functional scales, biochemical and electromyographic tests.

Methods: This is a longitudinal study conducted on 35 subjects: 20 JDM patients and 15 DMD patients at baseline and after 12 months of follow-up. In all patients, Quantitative MSUS measurements was performed to the biceps brachii muscle (BB), the forearm flexors (FF), the rectus femoris muscle (RF), the tibialis anterior muscle (TA) according to a standard protocol.¹ The captured images were analysed offline for muscle thickness and echo intensity (EI) by means of computer-assisted grayscale histogram analysis. Manual muscle testing (MMT) was assessed and serum creatine kinase (CK) levels were measured. Also, Quantitative electromyography (QEMG) assessment was performed as BB and RF were studied on the most affected side with emphasis on motor unit potential (MUP) duration, area to amplitude ratio (AAR).

Results: In JDM patients, EI of the proximal muscles (BB and RF) at 12 months follow up (75.32±29.84 and 74.73±25.58 respectively) were highly significantly decreased compared to their baseline EI (127.18±50.62 and 100.68±33.65 respectively) (p<0.05). Also, EI of BB and RF at 12 months follow up showed statistically significant correlation with their MMT (r=-0.51, p<0.05), CK levels (r=0.42, p<0.05) and MUP duration (p<0.05). In DMD patients, EI of BB, RF and TA muscles at 12 months follow up (122.3±41.29, 132.55±41.38 and 136.75±38.02 respectively) were significantly increased compared to their baseline EI (116.7±42.65, 124±43.33 and 133.3±39.57 respectively, p<0.05). Also, EI of BB, RF and TA at 12 months follow up showed statistically significant correlation with their MMT (r=-0.67, -0.68 and -0.68 respectively, p<0.05), CK levels (r=0.77, 0.76 and 0.7 respectively, p<0.05), MUP duration (r=-0.73, -0.58 and -0.53 respectively, p<0.05) and AAR ratio (r=-0.79, -0.81 and -0.62 respectively, p<0.05). Logistic regression analysis showed that baseline EI were predictive of follow up MMT score in both JDM and DMD patients (p=0.03 and 0.01 respectively).

Conclusions: Quantitative muscle US is a sensitive, objective technique for measuring the presence and severity of muscle pathology in both JDM and DMD patients. EI is remarkably correlated with MMT, muscle enzymes and quantitative EMG suggesting that it could be a useful follow up tool to reflect disease severity and residual muscle damage.

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SAT0675 SOLUBLE VASCULAR ADHESION MOLECULE-1 IS OVEREXPRESSED IN PATIENTS WITH VASCULITIS, RHEUMATOID ARTHRITIS AND ANKYLOSING SPONDYLITIS

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Background: Markers in rheumatology are in great demand in order to objectively diagnose the presence and activity of disease. CRP or ESR frequently are normal in many conditions. Vascular cell adhesion molecules mediate transendothelial migration. Several soluble isoforms can be measured in serum as marker for endothelial activation, for example in synovitis or vasculitis. We have recently shown that soluble vascular cell adhesion molecule-1 (sVCAM-1) is elevated in patients with positive antinuclear antibodies.¹

Objectives: The objective of this study was to analyse sVCAM-1 in a set of several rheumatic diseases and compare them to age- and gender-matched healthy controls.

Methods: Cross sectional study with 223 patients with rheumatoid arthritis (RA), ankylosing spondylitis (AS), psoriatic arthritis (PsA) and different vasculitides. Patients were treated with routine immunosuppressive agents, where indicated. CRP (mean mg/l±SD, normal <5), ESR (mean mm/h±SD), standard clinical disease activity scores (mean ±SD) and sVCAM-1 (ng/ml±SEM) in serum, determined by ELISA, was analysed.

Results: Patients with RA (n=136) had a DAS28 of 2.54±0.83, a close to normal CRP of 6.43±10.52, ESR of 16.9±12.6 and sVCAM-1 levels of 225.40±20.35 vs. 158.90±7.32 (p=0.0025). Patients with vasculitis (n=20) had a mean BVAS of 24.85±10.68, CRP was 5.86±7.77 mg/dl, ESR 14.5±11.5 and sVCAM-1 levels were also significantly different as compared to HC with 358.20±68.91 vs. 122.60±14.62 (p=0.0013). Patients with AS (n=33) had a mean BASDAI of 4.16±2.40, a CRP of 4.06±4.67, ESR 12.0±8.8 and had sVCAM-1 levels of 291.30±51.91 vs. 144.60±34.01 (p=0.021). Patients with PsA (n=34) did not show significant changes.

Conclusions: sVCAM-1 might be an objective disease marker in patients with RA, vasculitis and AS. It might be more reliable than standard CRP, especially in vasculitis. Prospective studies are needed to determine if sVCAM-1 is a predictive marker of disease activity and perhaps specific for biologic treatment regimens.

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SAT0676 ULTRASOUND DETECTED INFLAMMATION IN RHEUMATOID ARTHRITIS: ELUCIDATING THE RELATIONSHIP WITH CLINICAL MANIFESTATIONS AT THE WRIST

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Background: Tender and swollen joint counts are part of rheumatoid arthritis (RA) disease activity assessments. While subclinical synovitis is now a well-known entity, the relationship between tender and swollen joints and ultrasound (US) detected inflammation has not been well explored.

Objectives: To compare US detected inflammation (synovitis and/or tenosynovitis) with joint swelling and/or tenderness of the wrist, an important joint in RA. Tendons are included as tenosynovitis on US can be mistaken for joint involvement clinically.

Methods: Wrist outcome groups (Groups) 1–4 were identified: 1=S0 T0 (not swollen, not tender); 2=S0 T1 (not swollen but tender); 3=S1 T0 (swollen but not tender); 4=S1 T1 (swollen and tender). Power Doppler (PD) and grey-scale (GS) US were used to grade (a) synovitis semi-quantitatively (0–3) at the following joint recesses: dorsal radiocarpal and intercarpal, dorsal ulnocarpal and volar radiocarpal, and (b) tenosynovitis dichotomously (0=no, 1=yes) at the following tendon sites: extensor digitorum, extensor carpi ulnaris, and flexor digitorum. Scores on each wrist consisted of a PD score, a GS score and a combined (PD +GS) US (CUS) score. Positivity (+ve) for PD, GS and CUS scores was analysed using a generalised linear repeated measures mixed model with binary distribution and logit link. Scores were analysed using a general linear repeated measures mixed model assuming Gaussian errors. In both analyses, patients were modelled as random effects, and wrist (R/L) and follow up visit (baseline, 3 months) as fixed effects. Pairwise comparisons on +ve and scores were carried out among the 4 groups in the context of the models. P-values were not adjusted for multiple comparisons.

Results: 122 wrist assessments resulted from 32 RA subjects (87.5% female; 78.1% Chinese; mean (SD) disease duration of 42.8 (52.9) months) who either started or escalated on systemic corticosteroids and DMARDs. All subjects were assessed at baseline and 29 at 3 months. Significant differences among Group scores were: 4 vs 1 (PD, $p=0.0031$; GS, $p=0.0159$; CUS, $p=0.0045$), 4 vs 2 (PD, $p=0.0176$; GS, $p=0.0160$; CUS, $p=0.0074$), and 4 vs 3 (CUS, $p=0.0374$). Significant differences among +ve were: 4 vs 1 (PD, $p=0.0007$), 4 vs 2 (PD, $p=0.0234$), and 3 vs 1 (PD, $p=0.0202$). No significant Group differences were found for 2 vs 1 (for +ve and scores) and when comparing the 4 groups for GS +ve and CUS +ve. Table 2 shows the frequency distribution of patients by wrist and follow up. There were no significant effects attributable to differences in wrists or follow up visit (p -values all >0.05).

Abstract SAT0676 – Table 1. Analysis summary of ultrasound scores and positivity in the wrist.

Wrist Outcome Group ¹	LS Mean ²	p-value comparison with S0T1			LS Mean Estimated Probability ³	p-value comparison with S0T1		
		S1T0	S1T0	S1T1		S0T1	S1T0	S1T1
		PD score				PD positivity		
1=S0T0	0.56	0.7545	0.0712	0.0031**	0.21	0.3151	0.0202*	0.0007***
2=S0T1	0.68		0.2518	0.0176*	0.38		0.3378	0.0234*
3=S1T0	1.12			0.1003	0.56			0.0552
4=S1T1	1.55				0.79			
		GS score				GS positivity		
1=S0T0	3.61	0.8195	0.3803	0.0159*	0.83	0.4937	0.3008	0.9983
2=S0T1	3.45		0.3544	0.0160*	0.91		0.9707	0.9984
3=S1T0	4.11			0.0549	0.90			0.9984
4=S1T1	5.05				1.00			
		Combined US (PD+GS) score				Combined US (PD + GS) positivity		
1=S0T0	4.22	0.9145	0.2063	0.0045**	0.83	0.4937	0.3008	0.9983
2=S0T1	4.12		0.2641	0.0074**	0.91		0.9707	0.9984
3=S1T0	5.21			0.0374*	0.90			0.9984
4=S1T1	6.60				1.00			

¹ Wrist Outcome Groups: 1=S0T0 (not swollen, not tender), 2=S0T1 (not swollen but tender), 3=S1T0 (swollen but not tender), 4=S1T1 (swollen and tender).

² Least squares mean from general linear repeated measures mixed model with Gaussian error; patients modelled as random effects, wrist (R/L) and follow up visits (BL, 3mo) modelled as fixed effects. No significant differences between wrists ($p=0.1886$) or follow up visits ($p=0.4106$).

³ Least squares mean estimated probability using a generalized linear repeated measures mixed model with binary probability distribution and logit link; patients modelled as random effects, wrist (R/L) and follow up visits (BL, 3mo) modelled as fixed effects. No significant differences between wrists ($p=0.3720$) or follow up visits ($p=0.5052$).

Statistically significant: * $p<0.05$; ** $p<0.01$; *** $p<0.001$

Abstract SAT0676 – Table 2. Frequency distribution of subjects by follow-up and wrist

Wrist Outcome Group ¹	Baseline (N=32 subjects)		3-Months (N=29 subjects)	
	Left n (%)	Right n (%)	Left n (%)	Right n (%)
1:S0T0	7 (21.9)	6 (18.8)	7 (24.1)	8 (27.6)
2:S0T1	3 (9.4)	4 (12.5)	3 (10.3)	1 (3.4)
3:S1T0	9 (28.1)	9 (28.1)	11 (37.9)	10 (34.5)
4:S1T1	13 (40.6)	13 (40.6)	8 (27.6)	10 (34.5)

¹ Wrist outcome groups: 1=S0T0 (not swollen, not tender), 2=S0T1 (not swollen but tender), 3=S1T0 (swollen but not tender), 4=S1T1 (swollen and tender).

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SATURDAY, 16 JUNE 2018

Epidemiology, risk factors for disease or disease progression

SAT0677

PREVOTELLA COPRI IN INDIVIDUALS AT RISK FOR RHEUMATOID ARTHRITIS

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Background: *Prevotella* spp. have been identified as highly enriched in the intestinal microbiota of patients newly diagnosed with rheumatoid arthritis (RA), suggesting a role in the development of the disease.¹ Sequence homology between RA-specific autoantigens and proteins of *Prevotella copri* have been reported.² However, the role of these bacteria in the pathogenesis of the disease is not yet established.

Objectives: To determine the microbiome composition and prevalence of *Prevotella* spp. in different pre-clinical phases of RA, in a group of individuals at risk for RA, namely first degree relatives of patients with RA (RA-FDR).

Methods: In an ongoing cohort study of RA-FDR, enrolling individuals without clinical evidence of RA at inclusion, we categorised individuals in the following groups: 'healthy controls': asymptomatic RA-FDR without any autoantibodies or symptoms associated with possible RA; 'pre-clinical RA': individuals with 'systemic autoimmunity associated with RA' defined by the presence of anti-citrullinated peptide antibodies (ACPA) or rheumatoid factor (RF) and/or symptomatic individuals with clinically suspect arthralgias or unclassified arthritis. Participants provided stool samples for microbiome analysis. We excluded subjects who had undergone antibiotic therapy within the last 3 months, with known history of inflammatory bowel disease and/or gastrointestinal tract surgery ever. Stool samples processing and microbial diversity culture-independent analyses were performed. After DNA extraction, the V4 region of the 16S rRNA gene was amplified using barcoded primers and sequencing was done on an Illumina MiSeq. Statistical analyses of community structures were performed.³

Results: Of the 134 participants enrolled, 51 were categorised as 'healthy controls' and 83 as 'pre-clinical RA'. Table 1 shows the general characteristics of the two groups. The microbiota of 'pre-clinical RA' individuals was significantly altered compared to 'healthy controls', with abundance of specific bacteria, particularly an enrichment of *Prevotella* spp. (figure 1).

Abstract SAT0677 – Table 1. General characteristics of participants

Characteristics	Healthy controls n=51	Pre-clinical RA** n=83
Age, median (IQR)	55 (47–62)	58 (50–66)
Female sex, n (%)	39 (76)	74 (89)
Current Smoking, n (%)	12 (23)	16 (19)
Current Alcohol, n (%)	22 (46)	29 ⁽⁴¹⁾
Body mass index, median (IQR)	24 (22–27)	24 (22–27)
Obesity, BMI ≥ 30 , n (%)	5 (10)	9 (11)
ACPA positivity, n (%)	0 (0)	38 (46)*
RF positivity, n (%)	0 (0)	28 (34)*
Shared epitope (1 or 2 copies), n (%)	32 (65)	42 (52)

* p -value <0.05 , Kruskal-Wallis test for continuous variables and Fisher's exact test for categorical variables. **Pre-clinical RA group includes individuals with ACPA or RF positivity and/or with arthralgia or unclassified arthritis.

Abstract SAT0677 – Figure 1. Linear discriminant analysis (LDA) effect size (LEfSe) estimates the different relative abundance of bacteria in Healthy controls and Pre-clinical RA participants